Terrace Water Company
DWR Water-Energy Grant Application
Attachment 2 – Water and Energy Savings and GHG Calculations

Water and Energy Savings and GHG Calculations – Supporting Documentation

- Terrace Water Company's has well production of 127 MG/year.
    - 582 customer connections (98% residential) with average daily use of 600 gallons

- American Leak Detection Services estimated that the detected leaks that the proposed project will correct total 1.5 gallons per minute. This calculates out to a yearly water loss of 1,051,200 gallons. After the proposed project is completed it is assumed that this total amount of losses will be removed from Terrace Water Company's water usage. See attached Leak Documentation report from American Leak Detection Services.

- Hot water savings are not applicable to this proposed project.

- The useful life of PVC pipe has been conservatively estimated at 50 years. Gate valves that are regularly exercised have a useful life of at least 25 years.

- Terrace Water Company does not import potable water.

- The Energy Intensity (EI) of the system was calculated as follows:

    - Terrace Water Company produces potable water from two wells which deliver water to potable water storage tanks. Mechanical data for these two wells is provided below (all numbers provided by system operator).
        - Well No. 1 – 600 gpm @ 60 hp
        - Well No. 2 – 425 gpm @ 100 hp
    - A booster station delivers water from the storage tanks to the distribution system. Mechanical data for this well is provided below
        - Booster Station – 1,540 gpm @ 30 hp
    - Utilizing the case of Well No.1 providing water to the potable water tanks, which is then sent to the distribution system by the booster pumps, the total horsepower required is 90 hp
        - Well No.1 (60 hp) + Booster Station (30 hp)
        - 90 hp is equal to 61.74 kW
    - To calculate the EI of Well No. 1 in kWh/MG, the equation EI=Energy/Flow, following values were used
        - Energy = 44.7 kW (60 hp)
        - Flow = 600 gpm
    - This results in an EI of 0.00124 kWh/gallon, or 1,241 kWh/MG for water produced by Well No. 1

- To calculate the EI of Well No. 2 in kWh/MG, the equation EI=Energy/Flow, following values were used
  - Energy = 74.5 kW (100 hp)
  - Flow = 425 gpm
- This results in an EI of 0.00292 kWh/gallon, or 2,921 kWh/MG for water produced by Well No. 1
- Assuming that well usage is divided evenly, the average EI for delivered potable water to TWC's potable water tanks is:
  - EI=2,081 kWh/MG
- To calculate the EI of the Booster Station in kWh/MG, the equation EI=Energy/Flow, following values were used
  - Energy = 22.4 kW (30 hp)
  - Flow = 1,540 gpm
- This results in an EI of 0.000242 kWh/gallon, or 242 kWh/MG for water delivered to the distribution system by the Booster Station.

- The calculated EI value of 2,323 kWh/MG is utilized for this application.
  - Average Well EI + Booster Station EI
  - 2,081 kWh/MG + 242 kWh/MG = 2,323 kWh/MG

- The default value of 0.278 was used for the total output emission rate.